White Paper: Lake Area Technical Institute (LATI)

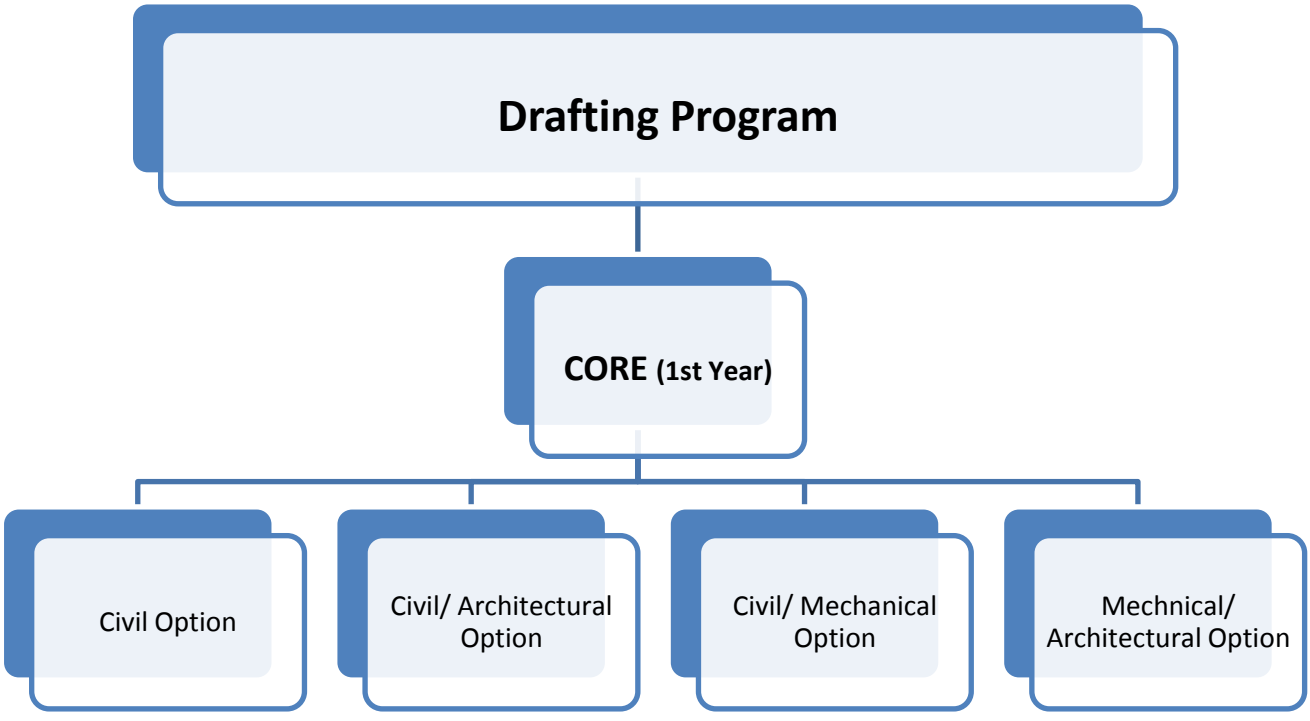
Drafting Technology Program Restructure

July 2010

Drafting Technology Program- Curriculum Restructure and Option Additions

Rationale for change

Approached by various segments of the Drafting and Engineering community, and as a result of self-assessment of our program, the Engineering/Architectural Drafting department, in concert with their Advisory Board and LATI administration, renamed the program and restructured the curriculum. The curriculum was restructured as depicted below. Students receive a common foundation of drafting education, with exposure to each of the three different disciplines. Building upon that foundation, students may choose an exclusive civil option, a civil-mechanical option, a civil-architectural option, or an architectural-mechanical option. This change enables students to take the option blend which is right for them. These options allow students to take selected in-depth courses in areas of their greatest interest.



Methodology

Our restructured program will have options that will more specifically meet the needs and desires of specific sectors of the industry. We have developed each option in concert with business partners.

Much of our curriculum will be offered in classroom or lab with plans and preparation to expand on-line education hybrid opportunities. Some of our lab training may, however, not be effective in an on-line format.

The Core: All students majoring in the drafting program will complete the core semesters, laying the foundational knowledge and providing a taste of each of the primary fields. The core program trains engineering technicians to skillfully transfer rough sketches and basic ideas into accurate, precise, universally understood drawings. Students will spend equal time studying the basics of architectural drafting, mechanical drafting and civil engineering technology.

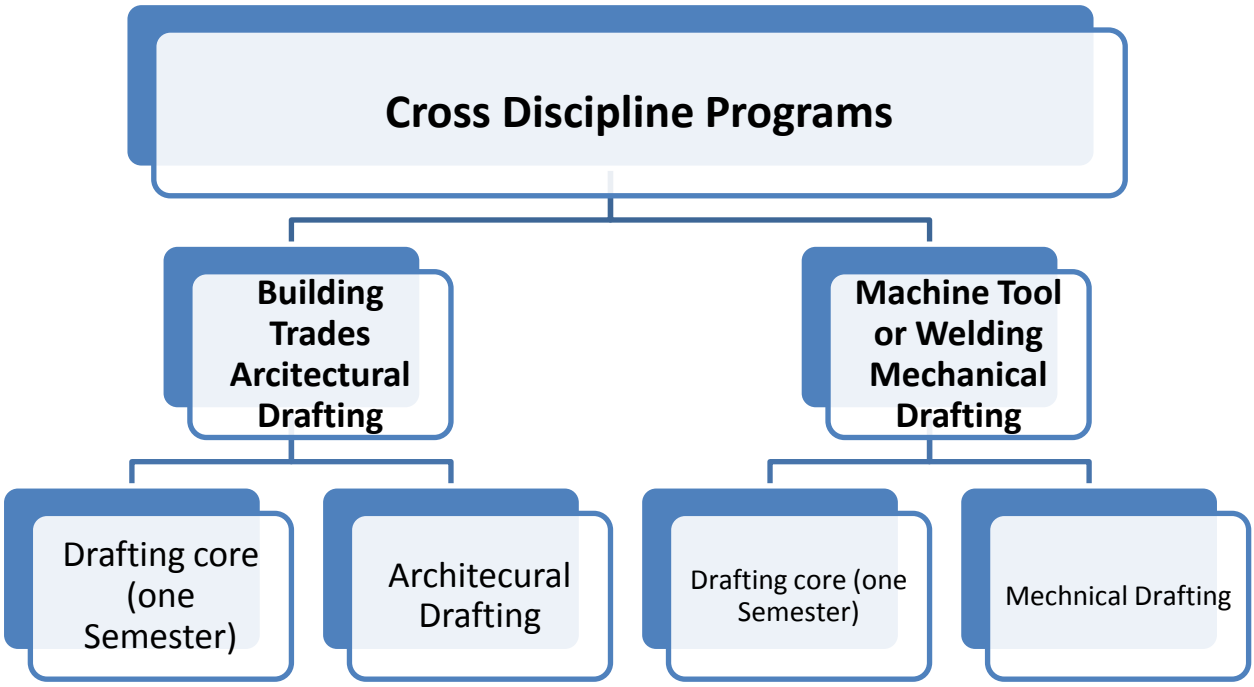
In their second year of the A.A.S. degree, they would select their preferred option. The following options will be included in curriculum:

Civil Drafting Option (Civil I and II) is designed to educate an employee in the basics required to step right in and be a productive member of a survey field crew or understand the basics needed to be an in-house draftsperson. Graduates are also able to work in either a field or office setting with general understanding of most aspects of the engineering industry. With the most in-depth option, students receive a full year of civil engineering focus including land surveying, Global Positioning, Geographic Information, Concrete Technology, const. surveying, design surveying, bridge inspection, materials testing, project inspection and Plans/Specs. This option will be laid out for on-line training. Randy Bacon PLS, Helms & Associates, Jesse Ulvestad, Banner & Associates, Brookings, SD have all had input into the development of this option. The instructor is licensed in South Dakota and North Dakota in Land Surveying and has been involved in land surveying/engineering for over 25 years either working for private or municipal agencies in SD, TX, NE, or ND.

Architectural Drafting Studies educates graduates for the positions in the Architectural design industry that is rapidly becoming a very important position for architectural offices or in the private building industry. As computer drafting technicians, they participate in the teams that produce design drawings, working drawings, or shop drawings. In addition to the architectural and construction industries, graduates work as technicians in building products manufacturing firms and government building departments. Graduates are able to apply sustainable building principles. The work will include all the technical aspects of architecture, but also includes some design and aesthetic elements. Drafters have a very strong knowledge base in their work. They're required to deal with multiple issues in preparing their plans. An architectural technician may be called upon to turn any part of a sketch or an entire draft plan, into a fully functional, technically accurate working drawing. This work requires a lot of detailed measurement, knowledge of materials, materials used for green design, quantification of architectural issues, and extreme accuracy. This one semester course of study will provide second year students with the skills and foundation required of a architectural drafting technician. David Todd, Todd Architects and Tony Ringheimer, Banner and Associates are industry representatives who have contributed to this curriculum.

Mechanical Drafting educates graduates for the positions in the mechanical design industry. In order to stay competitive, industry needs to constantly update their products are create new products as the old ones become obsolete. For this reason, the mechanical design industry is always looking for individuals that have a creative mind and the ability to communicate their ideas though drawings. The work could include, but not be limited to, the redesign of an existing company product or research and development of new products. Rapid prototyping (3D printing) has also become a large part of the design process in the area of mechanical design. This one semester course of study will provide second year students with the skills and foundation required to be successful as a mechanical drafting technician. Darrin Hofmeister, Head of Engineering for Angus Palm Industries and Daren Lindner, Head of Engineering for Dakota Bodies are currently on our advisory board and have contributed to this curriculum.

Cross Discipline Enhancements



In addition to adding flexibility and specialization to drafting degree seeking students, this restructure also enables LATI to offer options to other programs. An option to augment a Building Trades Technology degree with a one year Architectural Drafting course of study will be offered to recent BTT graduates. Based upon the existing Online Mechanical Drafting program, augmenting either a Machine Tool or Welding A.A.S. with mechanical drafting provides a technician that can design and create mechanical parts and prototypes.

Industry Support

All the options have been created in consultation with Industry as outlined above. In addition, the Drafting Technology advisory committee is briefed on and approves the program's curriculum twice yearly. Providing overall guidance and direction to the program, the Drafting Technology Industry Advisory Board's current members are: Randy Bacon PLS, Helms & Associates, Aberdeen, SD; Jesse Ulvestad, Banner & Associates, Brookings, SD; Darrin Hofmeister, Head of Engineering for Angus Palm Industries; Daren Lindner, Head of Engineering for Dakota Bodies; Wade Lardy, Hi-Rollers, Sioux Falls, SD; Roger Sween, City of Watertown City Engineer's Office, Watertown, SD; and Kent Johnson, Benchmark Foam, Watertown, SD. All options have been developed with and approved by industry advisory boards.

Drafting Technology
Civil Drafting Technician

LAKE AREA TECHNICAL INSTITUTE
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Semester Outline

18 Months Credits Required for Graduation: 72
Associate of Applied Science (A.A.S.) Degree

2010 – 2011 Revised: 6/10

First Year – Fall Semester

Course Number	Course Title	Clock Hours	Credit
ENG 103	Mechanical Drafting Lab I	84	3
ENG 108	Introduction to Engineering Drawing Theory	42	1.5
ENG 109	Architectural Drafting I Theory	70	2.5
ENG 112	Architectural Drafting I Lab With CAD	140	5
ENG 143	Computer-Assisted Drafting I	84	3
CIS 102	Windows Applications for Technicians	48	3
	Total	468	18

First Year – Spring Semester

Course Number	Course Title	Clock Hours	Credit
ENG 144	Computer-Assisted Drafting II	84	3
ENG 150	Introduction to Mechanical Theory II	28	1
ENG 151	Theory of Surveying Practice	56	2
ENG 153	Mechanical Drafting Lab II	56	2
ENG 156	Basic Civil Drafting	28	1
ENG 176	Basic Surveying Procedures	84	3
• Selected Communications Course		48	3
• Selected Mathematics Course		48	3
	Total	432	18

Second Year – Fall Semester

Course Number	Course Title	Clock Hours	Credit
ENG 203	Applied Civil Mathematics	56	2
ENG 206	Print/Plan Reading	28	1
ENG 223	Intermediate Surveying Procedures	168	6
ENG 229	Intro to Civil 3D	168	6
• Selected Behavioral Science Course		48	3
	Total	468	18

Second Year – Spring Semester

Course Number	Course Title	Clock Hours	Credit
ENG 237	Construction Materials with Lab	98	3.5
ENG 238	Intro to GIS/ArcGIS	70	2.5
ENG 239	Advanced Survey Procedures with Law	98	3.5
ENG 242	Advanced Civil 3D	140	5
AED 100	Automated External Defibrillator	14	.5
• Selected Social Science Course		48	3
	Total	468	18

- Students will select a course in each of the areas listed to meet general education requirements. Courses marked with an asterisk can be transferred directly to the university system under the terms of articulation agreements and may be substituted for recommended courses on the outline. Students should speak with an advisor before doing so.

Behavioral Science
PSYC 100 – Psychology of Human Relations
PSYC 101 – General Psychology *

Communications
COMM 101 – Contemporary Communication
ENGL 101 – Composition *
SPCM 101 – Fundamentals of Speech *

Mathematics
MATH 100 – Applied General Math
MATH 101 – Intermediate Algebra
MATH 102 – College Algebra *

Social Science
ECON 105 – Leadership in the Global Workplace
ECON 201 – Principles of Microeconomics I *
ECON 202 – Principles of Macroeconomics II *

Drafting Technology

Civil/Architectural Drafting Technician

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ENG 112	Architectural Drafting I Lab With CAD	140	5
ENG 143	Computer-Assisted Drafting I	84	3
CIS 102	Windows Applications for Technicians	48	3
	Total	468	18

First Year – Spring Semester

Course Number	Course Title	Clock Hours	Credit
ENG 144	Computer-Assisted Drafting II	84	3
ENG 150	Introduction to Mechanical Theory II	28	1
ENG 151	Theory of Surveying Practice	56	2
ENG 153	Mechanical Drafting Lab II	56	2
ENG 156	Basic Civil Drafting	28	1
ENG 176	Basic Surveying Procedures	84	3
• Selected Communications Course		48	3
• Selected Mathematics Course		48	3
	Total	432	18

Second Year – Fall Semester (Civil)

Course Number	Course Title	Clock Hours	Credit
ENG 203	Applied Civil Mathematics	56	2
ENG 206	Print/ Plan Reading	28	1
ENG 223	Intermediate Surveying Procedures	168	6
ENG 229	Intro to Civil 3D	168	6
• Selected Behavioral Science Course		48	3
	Total	468	18

Second Year – Spring Semester (Architectural)

Course Number	Course Title	Clock Hours	Credit
ENG 245	Architectural Drafting II Theory	84	3
ENG 260	Architectural Presentation	42	1.5
ENG 272	Applied CAD II – Architectural	280	10
AED 100	Automated External Defibrillator	14	.5
• Selected Social Science Course		48	3
	Total	468	18

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Behavioral Science
PSYC 100 – Psychology of Human Relations
PSYC 101 – General Psychology *

Communications
COMM 101 – Contemporary Communication
ENGL 101 – Composition *
SPCM 101 – Fundamentals of Speech *

Mathematics
MATH 100 – Applied General Math
MATH 101 – Intermediate Algebra
MATH 102 – College Algebra *

Social Science
ECON 105 – Leadership in the Global Workplace
ECON 201 – Principles of Microeconomics I *
ECON 202 – Principles of Macroeconomics II *

Drafting Technology

Civil/Mechanical Drafting Technician

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Course Number	Course Title	Clock Hours	Credit
ENG 103	Mechanical Drafting Lab I	84	3
ENG 108	Introduction to Engineering Drawing Theory	42	1.5
ENG 109	Architectural Drafting I Theory	70	2.5
ENG 112	Architectural Drafting I Lab With CAD	140	5
ENG 143	Computer-Assisted Drafting I	84	3
CIS 102	Windows Applications for Technicians	48	3
	Total	468	18

First Year – Spring Semester

Course Number	Course Title	Clock Hours	Credit
ENG 144	Computer-Assisted Drafting II	84	3
ENG 150	Introduction to Mechanical Theory II	28	1
ENG 151	Theory of Surveying Practice	56	2
ENG 153	Mechanical Drafting Lab II	56	2
ENG 156	Basic Civil Drafting	28	1
ENG 176	Basic Surveying Procedures	84	3
• Selected Communications Course		48	3
• Selected Mathematics Course		48	3
	Total	432	18

Second Year – Fall Semester (Civil)

Course Number	Course Title	Clock Hours	Credit
ENG 203	Applied Civil Mathematics	56	2
ENG 206	Print/Plan Reading	28	1
ENG 223	Advanced Surveying Procedures	168	6
ENG 229	Advanced Civil Drafting with CAD	168	6
• Selected Behavioral Science Course		48	3
	Total	468	18

Second Year – Spring Semester (Mechanical)

Course Number	Course Title	Clock Hours	Credit
ENG 250	Engineering Drawing II Theory	84	3
ENG 261	Mechanical Presentation	42	1.5
ENG 271	Advanced Mechanical Drafting With CAD	280	10
AED 100	Automated External Defibrillator	14	.5
• Selected Social Science Course		48	3
	Total	468	18

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Behavioral Science
PSYC 100 – Psychology of Human Relations
PSYC 101 – General Psychology *

Communications
COMM 101 – Contemporary Communication
ENGL 101 – Composition *
SPCM 101 – Fundamentals of Speech *

Mathematics
MATH 100 – Applied General Math
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Social Science
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ECON 201 – Principles of Microeconomics I *
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Drafting Technology

Mechanical/Architectural Drafting Technician

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Semester Outline

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2010 – 2011 Revised: 6/10

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ENG 109	Architectural Drafting I Theory	70	2.5
ENG 112	Architectural Drafting I Lab With CAD	140	5
ENG 143	Computer-Assisted Drafting I	84	3
CIS 102	Windows Applications for Technicians	48	3
	Total	468	18

First Year – Spring Semester

Course Number	Course Title	Clock Hours	Credit
ENG 144	Computer-Assisted Drafting II	84	3
ENG 150	Introduction to Mechanical Theory II	28	1
ENG 151	Theory of Surveying Practice	56	2
ENG 153	Mechanical Drafting Lab II	56	2
ENG 156	Basic Civil Drafting	28	1
ENG 176	Basic Surveying Procedures	84	3
• Selected Communications Course		48	3
• Selected Mathematics Course		48	3
	Total	432	18

Second Year – Fall Semester

Course Number	Course Title	Clock Hours	Credit
ENG 246	Mechanical Presentation	56	2
ENG 250	Engineering Drawing II Theory	84	3
ENG 271	Advanced Mechanical Drafting With CAD	280	10
• Selected Social Science Course		48	3
	Total	468	18

Second Year – Spring Semester

Course Number	Course Title	Clock Hours	Credit
ENG 245	Architectural Drafting II Theory	84	3
ENG 260	Architectural Presentation	42	1.5
ENG 272	Applied CAD II – Architectural	280	10
AED 100	Automated External Defibrillator	14	.5
• Selected Social Science Course		48	3
	Total	468	18

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Drafting Technology
Optional Third Year

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Semester Outline

18 Months Credits Required for Graduation: 36

2010 – 2011 Revised: 6/10

Architectural Drafting Technician for Building Trades

Course Number	Course Title	Clock Hours	Credits
ENG 108	Introduction to Engineering Drawing Theory	42	1.5
ENG 109	Architectural Drafting I Theory	70	2.5
ENG 112	Architectural Drafting I Lab With CAD	140	5
ENG 103	Mechanical Drafting Lab I	84	3
ENG 143	Computer-Assisted Drafting I	84	3
ENG 245	Architectural Drafting II Theory	84	3
ENG 260	Architectural Presentation	42	1.5
ENG 272	Applied CAD II - Architectural	280	10
ENG 237	Construction Materials with Lab	98	3.5
ENG 239	Intermediate Architectural Lab	84	3
	Total	1008	36

- OR -

Mechanical Drafting Technician for Machine Tool and Welding

Course Number	Course Title	Clock Hours	Credits
ENGO 100	Engineering Drawing Theory I	42	1.5
ENGO 105	Auto CAD Theory I	70	2.5
ENGO 110	Mechanical Drafting Lab I with CAD	84	3
ENGO 115	Engineering Drawing Theory II	42	1.5
ENGO 120	Auto CAD Theory II	70	2.5
ENGO 125	Mechanical Drafting Lab II with Cad	84	3
ENGO 130	Mechanical Drafting Lab III with Cad	28	1
ENGO 200	Engineering Drawing Theory III	42	1.5
ENGO 205	Fundamentals of Solid Modeling I	56	2
ENGO 210	Mechanical Drafting Lab IV with Cad	98	3.5
ENGO 215	Engineering Drawing Theory IV	42	1.5
ENGO 220	Fundamentals of Solid Modeling II	56	2
ENGO 225	Mechanical Drafting Lab V with Cad	98	3.5
ENGO 230	Fundamentals of Solid Modeling III	56	2
ENGO 235	Engineering Drawing Theory V	56	2
• Selected General Education Course		48	3
	Total	972	36

- Students will select a course in each of the areas listed to meet general education requirements. Courses marked with an asterisk can be transferred directly to the university system under the terms of articulation agreements and may be substituted for recommended courses on the outline. Students should speak with an advisor before doing so.

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